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SCIENCE NEWS LETTER

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Winners Visit President

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A SCIENCE SERVICE PUBLICATION

OCEANOGRAPHY

Test Drilling for Moho

► **WELL DRILLING** aimed at piercing through the ocean floor to the earth's depths was scheduled to begin March 12, and continue for a month.

The first in a series of wells that scientists hope will eventually reveal the secrets of the mantle underneath the earth's crust will be drilled near Guadalupe Island in the Pacific Ocean.

A remodeled drilling ship, especially rigged for the project, will drill in water nearly two and one-half miles deep. No other ship has drilled in depths of more than a few hundred feet of water.

Scientists hope the test probe will yield enough scientific information for the final assault: penetrating the earth's mantle, 1,000 feet below the ocean floor.

The project, which is sponsored by the National Academy of Sciences, is actually the preliminary work before drilling the

"Mohole," aimed at obtaining an actual sample of the mantle.

The mantle, which accounts for about 84% of the earth's volume, lies underneath the earth's crust, the relatively thin upper layer on which the oceans and continents rest. Little is known about the mantle except that it carries shock waves from earthquakes much faster than does the crust.

The contact between the soft layers of the crust and the mantle is known as the Mohorovicic discontinuity, or "Moho," after the Yugoslav seismologist who discovered it. The project for a hole through the Moho became known as Project Mohole.

The crust forms a thin veneer above the mantle. It is thickest under the continents and thins out under the oceans. Scientists picture the lighter crust "floating" on a dense, but plastic-like, mantle.

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ARCHAEOLOGY

New Link to Old Jericho

► **MUD-BRICK HOUSES** and plastered floors may have been a dime a dozen in the late stone age.

A new find of a pre-Sumerian culture in Turkey that includes remains of these buildings, found earlier at Old Testament Jericho, has been made.

Dr. Gus W. Van Beek, Smithsonian Institution archaeologist, told **SCIENCE SERVICE** such buildings may have been very common in the Neolithic, or new stone age, although only very few have been discovered so far.

He said it is quite possible this building method had spread from Turkey to Palestine, or vice versa, and had extended over large areas.

The new find, made by Dr. James Mallaart, assistant director of the British Archaeological Institute in Ankara, dates back to 7000 B.C. The floors of the build-

ings were polished to make them less porous and waterproof, as were the floors at the Old Testament Jericho site, Dr. Van Beek said.

Jericho is the oldest known city complete with city walls, he said. It goes back to 9000 B.C., or the beginning of the Neolithic age.

However, it is often difficult to find Neolithic layers of cultural remains because they frequently are so low they are below the water table. This is especially true in Mesopotamia, he said.

For this reason, the new find by Dr. Mallaart is important. It is also significant as an indication that the Neolithic culture extended over larger areas than evidence has shown so far.

Dr. Van Beek and Mallaart worked together on the Old Testament Jericho site.

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NATURAL RESOURCES

Need Faster Information

► **HORSE AND BUGGY** methods of circulating information to scientists are giving way to computer-type machines that can prevent duplication of effort.

"Grave wastage of men, money, facilities and time" can result unless there is effective circulation of information, Senator Hubert H. Humphrey (D-Minn.), chairman of the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, charged.

By the end of March Senator Humphrey's committee will complete a two-volume report for the White House. From this information, Dr. Jerome B. Wiesner, Presi-

dent Kennedy's science adviser, is expected to have sufficient facts to recommend elimination of hand-managed index cards, inadequate to cover the thousands of scientific projects in research.

Senator Humphrey's committee showed that there are now some 22,924 biomedical projects supported by the Government at a cost of more than \$455,000,000. Of these, 12,065 are supported by the National Institutes of Health and the other 10,859 are supported by other Government agencies.

So far primary attention has been paid to information about published material. This leaves scientists undertaking new projects

without proper knowledge of what already may have previously been done.

The Science Information Exchange of the Smithsonian Institution, formerly known as the Bio-Sciences Information Exchange, is expected to expand its information coverage to include registration of current projects in the mathematical, physical, engineering and social sciences.

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GNAT MERRY-GO-ROUND—Gnat traps, devised to combat the gnat pest in southern California, consist of inverted glass funnels that turn slowly on a motor-driven platform to lure the gnats inside. The funnels contain a substance equal in attraction to gnats as that of humans. University of California, Riverside, Calif., scientists add repellents to cut down the attracting power.

METEOROLOGY

Tornado Season Hits U. S Full Force

► **THE TORNADOES** that recently cut a swath through Illinois and Indiana provide a grim warning: the tornado season is here.

Although the season had its usual slow start, the time for twisters is ripening, and will last until the summer months.

More than half the tornadoes strike in April, May and June. Most occur between noon and midnight, with the most dangerous hours between the afternoon hours of four and six.

When a tornado strikes, the safest place is an underground shelter. A tornado warning means take cover immediately. If no shelter is available, head for the nearest ditch or depression in the ground.

The terrifying twisters kill tens of persons and cause millions of dollars worth of damage in the United States each year. The tornado that ripped through southern Chicago recently killed one person, injured at least 115 persons and caused \$5,000,000 worth of damage.

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NATURAL RESOURCES

Oil Fouling U.S. Coast

Tankers dumped oil sludge too close to port, endangering wildlife and forcing small resort towns to close. Agreement against dumping does not cover U. S., Gloria Ball reports.

► PROHIBITION of oil dumping by tankers in coastal waters was one of the hottest issues at the 26th North American Wildlife and Natural Resources Conference held in Washington, D. C.

The problem is that tankers have been cleaning their tanks and dumping the sludge too close to port. The oil washes to shore and taints or kills oysters, clams and crabs, and covers shore birds with such a thick coating of oil that they cannot fly and eventually die.

Oil on beaches has forced small resort towns to close down at a loss of up to \$50,000 per day.

The problem is international, and in 1954 an agreement was proposed whereby a participating nation could prohibit oil dumping by other participating nations within 50 miles of its coast. The limit could be lessened or extended another 50 miles if the individual country desired. Britain, for example, has extended its limit because ocean currents carry in oil from much farther out than 50 miles.

Thirteen countries have signed the agreement, but the United States is not among them. A Senate bill aimed at getting the U. S. to participate was introduced more than a year ago but it never got out of committee.

C. R. Gutermuth, vice president of the

Wildlife Management Institute, said that "apathy" probably was the main reason no action has been taken.

Dr. Lloyd Meehan of the U. S. Fish and Wildlife Service cites a different reason, however. The bill is involved with the unwillingness of the U. S. to subject this country to the World Court, which would occur if the U. S. signed the agreement and became involved in an infringement of rights dispute.

Whatever the reason for inactivity on the bill, wildlife experts in the U. S. apparently believed some outside prompting was needed.

They called Parliament member James Callaghan, chairman of the coordinating advisory committee on oil pollution of the sea, from London to speak at the conference.

Mr. Callaghan said that as long as the U. S. refuses to sign the agreement, it has no control over foreign dumping along its coasts, and has little control over its own tankers' practices.

Another international meeting is being planned for sometime in 1962, at which time participating nations will make a strenuous effort to obtain the signatures of more countries, the U. S. included.

Eventually, the international committee hopes to prohibit dumping even on the

high seas. But it would be very easy for a vessel in open water to dump its wastes into the ocean on a dark night, Mr. Callaghan said.

One method of making it profitable for tankers to dump only into receptacles at part is to find a use for the sludge, such as in construction of macadam roads.

As if the tanker problem alone were not enough, oil from other sources is fouling U. S. coastal areas. Dr. Alfred L. Hawkes, executive director of the Audubon Society of Rhode Island, Providence, said that about a third of the oil pollution comes from shore installations. There is much spilling at refueling stations. Fuel holds of ships may be leaking a slight but steady stream, and ship disasters, groundings and sinkings, release a flood of oil.

In the Gulf areas, drilling operations cause oil pollution. In Cuba and California, natural oil, distinguishable from spilled oil, seeps from the ground.

Dr. Hawkes said the oil presents a fire hazard and endangers the water supply that soon will be coming from converted saline water.

In one duck-wintering area, more birds were killed by oil than by hunters. The oil also acts as a repellent to fish, and not only changes their migration routes but keeps them out of their breeding marshes as well.

Some animals, Dr. Hawkes said, are not killed by the oil. The quahog, a large clam, survives, but "tastes like a can of motor oil" when eaten.

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ORNITHOLOGY

Sandhill Cranes Bagged In Historic First Season

► THE FIRST open season on lesser sandhill cranes has ended in an even draw between man and bird. Hunters bagged only 300 birds, but also succeeded in scattering the cranes enough that their pillaging of field crops will not be so hard on farmers in any one area.

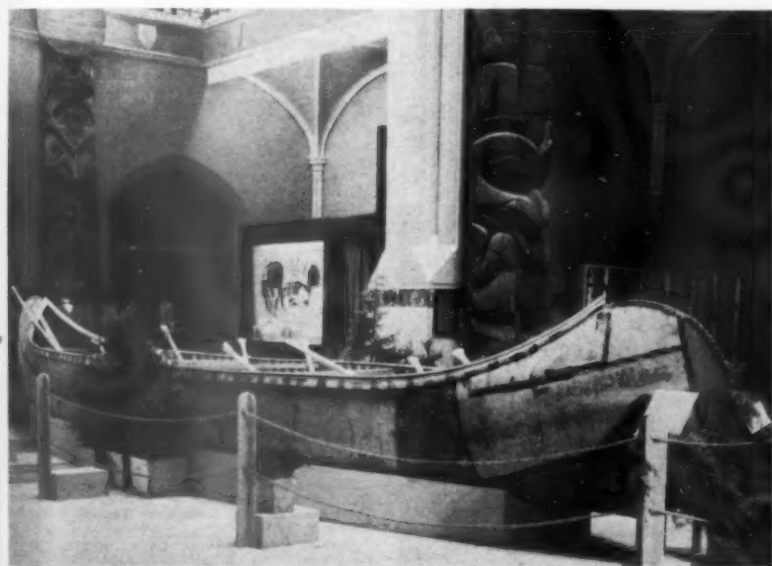
During the month-long hunting season in January, shooting was allowed only in the eastern tier of counties in New Mexico. This particular time and place were picked because the rare whooping cranes and greater sandhill cranes are safely out of the area at this time.

For several years, lesser sandhills, about 200,000 to 250,000 in number, have been eating so much wheat and sorghum that United States and Canadian officials agreed an open season should be declared.

Elliott S. Barker, wildlife consultant and New Mexico delegate to the National Wildlife Federation meeting in Washington, D. C., said about 45,000 of the cranes had been scared out of the shooting area into Texas and western New Mexico.

The 500 hunters who took advantage of the season probably got only 300 birds because the sandhill cranes are very wary, he said. They are big, about three feet tall, can stretch their necks to look over the grass and are difficult to surprise.

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VANISHED CANOE—Canada's National Museum, Ottawa, is displaying the world's largest and only birch canoe of a vanished type. It is 36½ feet long and three feet high in the center. An 82-year-old Chippewa Indian, the only living authority on this type of canoe, spent three years building this exact replica.

MEDICINE

Hefty Vets Thrive

► CHURCHILL, Hoover and 134 Spanish-American War Veterans of Massachusetts are upsetting medical research. Instead of following the pattern of their body build and dying of coronary artery disease, they seem to be candidates for extreme old age.

Two Veterans Administration physicians, Drs. Oliver J. Harris and James F. Cummins of the Boston VA outpatient clinic, said when they began their study of the 72- to 92-year-old vets, they expected to find them looking like Abraham Lincoln might have looked at their age. Instead, they turned out to appear more like Churchill and Hoover.

"Men of this type of body build," they said, "tend to die out rapidly in their forties and fifties, especially from coronary heart disorder."

None of the 134 have developed cancer of the lungs, the researchers said, despite

the fact that 25 continue to be heavy smokers and 51 were heavy smokers in the past.

One-third reached their highest weight after they were 70 and one-half after they were past 55 years old. Twenty-three have never had a serious illness and all appear to be remarkably healthy, both physically and mentally. Nor do they seem to be accident-prone.

The physicians said they will extend their studies to include World War I, World War II and Korean conflict survivors. This means they will be studying a cross section of the male population between the ages of 29 and 70.

They are aiming the study toward revealing clues to degenerative diseases and establishing norms for various age groups, the investigators explained.

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MEDICINE

120-Year Life Seen

► AMERICANS may have a life expectancy approaching 120 years by the end of this century.

The problems posed by this probability "merit careful study," the Journal of the American Medical Association, 175:706, 1961, states editorially.

"With eradication of infection, prevention of cancer and inhibition of progression of the degenerative diseases," life expectancy in America should approach that of the fabled Hunzukuts of northern Pakistan, the medical journal said.

Physicians will read other articles on aging concerning psychiatric and medical management of elderly persons.

"After the age of 65 years," Drs. Ewald W. Busse and John B. Reckless of Duke University Medical Center, Durham, N. C., said (p. 645), "the percentage of both men

and women admitted to mental hospitals for the first time rises sharply."

The physicians called on psychiatrists to help general practitioners and internists meet the aging's emotional needs by disseminating their knowledge to all members of the profession.

Changing the habits of the elderly man or woman may do more harm than good, Dr. Wingate M. Johnson of Winston-Salem, N. C., states (p. 649). Concessions to such lifelong habits as smoking, taking laxatives or wearing long underwear may be desirable unless there is some valid objection.

More adequate nutrition as well as supportive endocrine therapy for the aged are advised by Dr. Nathan W. Shock of Baltimore (p. 654). He says "preparation for a healthy old age may well begin in the office of the pediatrician."

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untreated rats had died, and all these later deaths, autopsies showed, were in fact due to damaged blood-forming tissues.

When these blood-forming tissues were protected from radiation by lead plate screening, only 65% of the DFP-treated rats died within a month, while 95% of the untreated rats succumbed.

Dr. Willoughby reports in *Nature*, 189:761, 1961, that the protective effect of DFP was the same whether given before, immediately after or 24 hours after irradiation, and that the treated rats could survive 2,200 roentgens, more than four times the lethal dose for man.

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PUBLIC HEALTH

Radiation Death Delayed

► THE FIRST WAVE of radiation deaths can be staved off with a nerve gas chemical known as DFP—even when given 24 hours after exposure to a deadly dose of radiation. DFP can give the victim more time, but death due to radiation cannot be put off indefinitely.

In whole body radiation, "acute" deaths, those occurring within six days after exposure, frequently are due to gastrointestinal damage. Later deaths usually result from damage to the blood-forming organs.

Dr. D. A. Willoughby of University

College Hospital Medical School in London found that DFP can cut down the acute deaths by protecting the gastrointestinal tract. DFP is used in rat poisons and insecticides. As a nerve gas, DFP can cause complete temporary collapse of the nervous systems in humans.

When he exposed untreated and DFP-treated rats to 975 roentgens of whole-body X-rays, about twice the amount required to kill a man, 60% of the untreated rats were dead within three days, while only 20% of those given DFP were dead. At the end of 28 days, however, just as many treated as

ROCKETS AND MISSILES

Rosy U.S. Space Picture

► SCIENTISTS from the National Aeronautics and Space Administration presented a glowing picture of this nation's future achievements and profits in space before the Senate Committee on Astronautics and Space Sciences. But the sad fact is that the United States cannot match present Soviet space capability until 1964.

U.S. excursions to Venus and Mars are not scheduled before that time, Dr. Abe Silverstein, director of NASA's office of space flight programs, told the Committee. But in the very near future an active repeater satellite program will both improve communications and cut down costs.

These satellites will be stabilized at a distance of 2,000 miles from earth so that they will orbit every 24 hours at the same rate as the earth.

Such satellites will be equipped to amplify messages sent from earth and relay the amplification back to earth at frequencies which can avoid blackouts that now occur

in all radio communications during periods of unusual solar activity.

Better weather information also will be available in the near future because of this nation's success with meteorological satellites, Dr. Silverstein said.

However, apart from practical applications, the ultimate scientific aim of all space exploration is directed at probing the secrets of the universe. Aimed at this goal are NASA's plans for orbiting solar, geophysical and astronomical laboratories. The solar launch is scheduled for this year and will carry a satellite of 380 pounds out into space with instrumentation designed to report back to earth on earth-solar relationships.

One of the aims of the civilian space program is to help other nations participate in upper atmosphere research. Those countries getting space aid from NASA include Italy, Canada, Great Britain, France, Japan, Norway, Sweden and Argentina.

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GENERAL SCIENCE

Young Humanitarians

► THE BEST of the coming generation of scientists are humanitarians as well as scientists, actively concerned with the deprivations of hunger, pain, ignorance and poverty among the peoples of the world.

Asked what single scientific discovery they considered most important, the 40 winners of the 20th Science Talent Search, all of them high school seniors, emphasized the development of new sources of cheap and abundant power and food supplies, cures for disease, unification and communication between scientific disciplines and people, and breakthroughs in understanding the most basic laws of biology, mathematics and the physical sciences.

Sources suggested for abundant power at very low cost included more efficiently controlled hydrogen fusion, solar electricity, deuterium from the oceans via controlled fusion, and atomic batteries.

Cancer, arthritis, birth defects and degenerative diseases of old age head the list of medical problems mentioned as being most important.

Comments made by these young persons included:

"The new science discovery most needed by the world today is a method of simplifying and reducing the cost of synthesizing our drugs. Some discovery is needed which will permit laboratories in other countries not as well equipped or endowed as America's to produce large quantities of the drugs needed to cure the ailments of their populations."

"The improvement of mankind's use of the tremendous progress of the last 50 years would mean extensive further development in the social sciences."

"Three essential discoveries are a process

for the production of foods at high efficiency from ocean plants; a contraceptive device, acceptable to all major creeds, for stemming the population explosion, and a system of communication cheap enough and powerful enough to make possible world-wide

speech between members of competing countries in large numbers."

These highly talented young scientists are not only aware of such problems, but are also preparing themselves to contribute to productive solutions.

Answering a question concerning their personal goals for the future, they mentioned plans to "be instrumental in the re-uniting of the arts and sciences, because of the widespread and deleterious effects of their present lack of communication"; to "make some contribution toward a successful integration of electronics and computers on one hand and medicine on the other"; and to "make an advancement in preventive medicine, correlating genetic inheritance of certain physical or chemical characteristics with the genetic inheritance of susceptibility to specific diseases."

They find basic questions very challenging in such fields as magnetism, gravity, electric charges, matter and energy; the integration of biological and physical sciences; the interactions of behavior, physiology and evolution; and cell structure. They are eager to join the search for answers.

A strong feeling of personal obligation to pass along knowledge and enthusiasm for science by teaching at some time in their careers is detectable in many comments of these young people. The teachers of these outstanding students apparently have left a shining mark upon their future aspirations.

The annual Science Talent Search is conducted by Science Clubs of America, an activity of SCIENCE SERVICE, and is supported by the Westinghouse Educational Foundation.

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WINNERS MEET PRESIDENT—At the White House President Kennedy and Vice President Johnson talked science with the 40 winners of the Science Talent Search (See p. 166).

GENERAL SCIENCE

Top Science Talent Chosen

The scholarships of the 20th Annual Science Talent Search were won by two young biologists and three mathematicians. All five are already accomplished scientists.

► THE MOST PROMISING young scientist of the year is 17-year-old Joshua Wallman of New York City, who has been engrossed in biological research since he was 13 years old. His current investigation of the courtship bowing of the male ring dove upsets the theory that it is purely a reflex action due to instinct.

As top winner in the 20th Science Talent Search conducted by SCIENCE SERVICE, he has been awarded the \$7,500 Westinghouse Science Scholarship. The judges selected him from a field of 4,000 high school seniors from all over the nation who submitted completely qualified entries.

Four other scholarships were awarded: \$6,000 to Edward C. Jones, 17, of Arlington, Va., a nimble-minded mathematician who is especially concerned with the relationships between logic and language.

\$5,000 to William M. Adkins III, 17, of Melbourne, Fla., another enthusiastic biologist who has been absorbed in his various research projects since he was 14 years old.

\$4,000 to 17-year-old Daniel E. Kleinman of Louisville, Ky., who looks forward to a lifetime in the challenging field of modern mathematics and mathematical philosophy.

\$3,000 to a talented little feminine scientist, Harriet J. Fell, 16, of Flushing, N. Y., who is equally deft in abstract mathematics and zoological research.

Bowing Behavior of Dove

The investigation that top winner Josh Wallman reported as part of his entry concerned the ring dove and its bowing behavior during courtship. Observing that birds unable to inflate the esophagus did not go through this bowing ritual, the young ornithologist investigated the role of the esophagus in the characteristic bowing.

Working through two summers at the Institute of Animal Behavior of Rutgers University, Newark, N. J., he designed his own experiments and spent many hours observing and photographing the male dove. He concluded that inflation of the esophagus was stimulated by introducing a female dove into the cage and that, in turn, the air pressure in the esophagus triggered the bowing.

In addition to his work at the Rutgers Institute, Josh has carried out detailed studies of feathers and of the origin of the domestic ring dove, in cooperation with the American Museum of Natural History, New York.

Josh edits the Journal of Biology at the Bronx High School of Science, where he is now a senior, and serves as chairman of the field trip committee of the Linnaean Society of New York.

Ed Jones, senior at Wakefield High School in Arlington, Va., has developed a special appreciation of simplicity and elegance in mathematical structure. He hopes some day to devise a method of discovering whether some of the classical unproved mathematical conjectures belong to the group of theorems that are true but can never be proved.

Ed's Search paper dealt with convex smooth curves and some proofs and interesting conjectures about them. He proved several geometric theorems about "p" lines, formed by joining points in which the curve is met by a pair of parallel tangents.

Bill Adkins has already begun the contributions he hopes to make to the field of biology through future studies of every aspect of the role of glands and hormones in biological phenomena. In his Search report, Bill described a new technique he designed for studying the role of the pineal gland in animals, shielding the gland from light by using petrolatum and non-drying putty. He concluded that normal functioning of the southern toad's pineal apparatus in response to light is necessary to the well-being of the amphibian, since with the pineal shielded it chose higher temperatures and light intensities and dryer sand than normally preferred.

Now a senior at Melbourne High School, Fla., Bill pays particular tribute to his biology teacher who encouraged him to think independently and try out his own ideas.

Dan Kleinman demonstrated unusual understanding of the language of numbers as early as fifth grade, when he figured out by himself how to determine permutations. Now a senior at Atherton High School in Louisville, the young Kentuckian has devised a new and original approach to the twin primes problem, an unproved number theory classic which conjectures that there are an infinite number of prime number pairs of the form p and p plus two.

Understanding Prime Numbers

Believing that resolution of the question would be an important step toward complete understanding of the distribution of prime numbers, Dan formulated two questions, equivalent to the primes problem, which should facilitate further investigation because they do not deal directly with primes.

Harriet Fell, the feminine member of the outstandingly promising quintet, is also a mathematician. She reported on her investigation of the properties of a linear algebra with 16 units, which may have application to quantum mechanics and to determining vectors in five-dimensional

space. Harriet works as a volunteer assistant in the department of animal behavior at the American Museum of Natural History and is completing advanced courses at Jamaica High School, Jamaica, N. Y., in calculus, analytical geometry and history of science. Whatever leisure is left is devoted to painting, ceramics, accordion, guitar and harmonica. Her picture of the future includes both university teaching, in mathematics or zoology, and marriage and children.

Robert M. Axelrod, 17, of Evanston Township High School, Evanston, Ill., was named as alternate to the \$3,000 scholarship. Michael Clarke Newlon, 18, of Western High School, Washington, D.C., was named second alternate.

Eight girls and 27 boys received Westinghouse Awards of \$250 each in recognition of their top level ability and promise as creative scientists of the future.

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GENERAL SCIENCE

Talent Search Winners Meet President Kennedy

See Front Cover

► THE 40 Science Talent Search winners visited the President during the trip to the Science Talent Institute in Washington, D.C. (See also p. 165)

President Kennedy and Vice President Johnson greeted each winner personally and discussed the science projects and future plans of the young scientists.

The group had elected Roger Paul Peters, Jr., 17, South Bend, Ind., to present gold Science Clubs of America emblems to the President and Vice President.

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BEST SCIENCE TALENT—Scholarship winners with their Science Talent Search projects and activities at the Science Talent Institute in Washington, D. C. Top, left to right, Joshua Wallman, William M. Adkins III and Edward C. Jones.

Center, left, Major Paul E. Tescham, M.C., U.S.A., Assistant Commandant, Walter Reed Army Institute of Research, and the top winner of the first Science Talent Search, shows a germ-free operating chamber to winners. Center, the winners in front of the Capitol. Center, right, winners visit the Smithsonian Institution.

Bottom, left to right, Robert M. Axelrod, Daniel E. Kleinman, and Harriet J. Fell.

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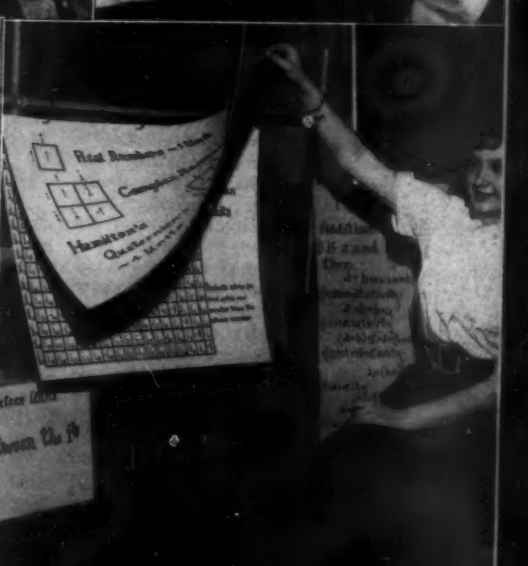
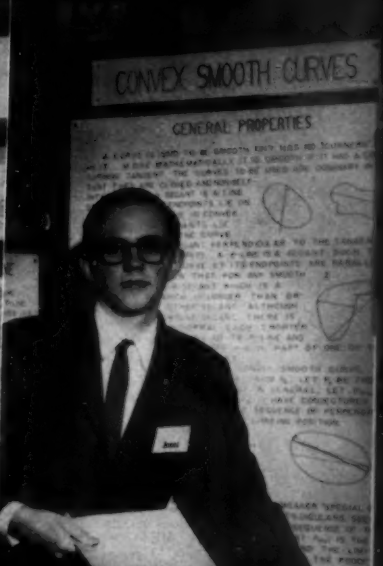
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MEDICINE

Time With Patients Important for Interns

► PATIENTS show dissatisfaction and poor cooperation because interns spend so little time with them, a study in Grace-New Haven Hospital, New Haven, Conn., indicates.

The need for security may be a basic reason for interns spending so much time in conferences rather than with their patients, the pilot study suggested. But the finer techniques of doctor-patient relationship should be learned during the period of formal training, the researchers advised.

Other possible reasons for spending only five or six hours a day with their patients may be:

The need for approval, tolerance and reassurance, especially from the intern's peers.

The need for acquiring specific techniques and knowledge of medicine, which he divorces from patient care.

The need to learn how to relate to other professionals in his first year as a professional.

The need to compete and move ahead "on the basis of his diagnostic and pathophysiologic acumen" rather than on the basis of his capacity to offer thorough patient care.

The study is reported in *The New England Journal of Medicine*, 264:439, 1961, by Drs. Henry E. Payson, instructor in psychiatry and medicine, Yale University School of Medicine; Eugene C. Gaenslen Jr., intern, Philadelphia General Hospital; and Fred L. Stargardt, intern, University of Virginia Hospital, Charlottesville.

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AGRICULTURE

Sugar Deadly as Poison As Nematode Killer

► ORDINARY SUGAR has been found one of the best worm killers ever known. Not particularly harmful to earthworms, the sugar is as deadly as poison to the tiny round worms, or nematodes, that parasitize and sicken food-producing plants and trees.

This is the first time a substance not generally classed as toxic has been shown to be a nematode killer. Unlike other pesticides, the sugar kills by dehydrating the worm. It literally shrivels him up into dust. So effective is the method that in some of the tests, scientists could not find a trace of the worms—even with a microscope—24 hours after they had been doused in sugar water.

How deadly sugar is to nematodes was discovered by plant pathologist W. A. Feder at the U.S. Department of Agriculture's Horticultural Field Laboratory at Orlando, Fla., almost by accident. He had added cane sugar, or sucrose, to soil to test its value as a nutrient for nematodes and nematode-capturing fungi. Twenty-four hours later, he found a large number of the nematodes gone.

Later tests showed that the nematodes

thrived on weaker sugar solutions but died when more concentrated ones were used.

A one percent sugar solution kills every nematode in 24 hours when soil moisture is one to two percent. Different soil moisture conditions require different sugar concentrations. Some of the plants, such as okra, thrived on the sugar, while citrus trees and corn were retarded.

However, the sugar can be flushed out of the soil when all the worms are dead and the plant or tree goes on to grow normally, Mr. Feder reported in *Agricultural Research*, 9:3, 1961.

• Science News Letter, 79:168 March 18, 1961

ANIMAL HUSBANDRY

Identical Twin Calves Sought by Veterinarians

► VETERINARY SCIENTISTS at the U.S. Department of Agriculture and at Kansas State University, Manhattan, are looking for identical twin bull calves for research purposes.

Identical twin calves are rare. They are developed from a single cell and essentially are one animal with two bodies. They are always the same sex, look very much alike, and react in much the same manner.

Such twins have been used to test antibiotics and different diets, to show that the tendency to bloat is inherited, and to learn how bacteria in a cow's paunch help digest feed.

USDA will buy either purebred, grade or crossbred beef-type bull calves less than five months old if they are within a 250-mile radius of Washington, D.C. KSU is searching for identical twin dairy animals, either bull calves or females up to three year old, within a 500-mile radius of Manhattan, Kans.

Anyone within the designated areas who finds suitable animals in his herds should contact Dr. Everett J. Warwick, chief, beef cattle research branch, Animal Husbandry Research Division, Beltsville, Md., or Dairy Department, Kansas State University, Manhattan, Kans.

• Science News Letter, 79:168 March 18, 1961

SURGERY

Boiling Water Method Relieves Nerve Ailment

► BOILING WATER has been used to destroy nerve cells for relief of a painful nerve ailment.

This technique, used also to induce lesions in the frontal lobes, destroys nerve cells in the gasserian ganglion and gives permanent relief to persons suffering from tic douloureux, a form of neuralgia of the facial nerve.

Dr. Rudolph Jaeger of Jefferson Medical College, Philadelphia, told the American College of Surgeons meeting in Philadelphia that 300 patients have been treated with the hot water method.

He said the results achieved from this method are far better than from operative and medical therapy.

• Science News Letter, 79:168 March 18, 1961

IN SCIENCE

MEDICINE

Organism Found in Chicken and Eggs

► RAW EGGS and undercooked chickens can be dangerous. Both the hen and the egg may be carrying the organism that causes brain-damaging encephalitis in children and a spotted fever-like disease in adults.

Three Indian scientists found and for the first time definitely identified, the protozoan, *Toxoplasma gondii*, in eggs. Although the laying hens showed no signs of illness, and had no relevant antibodies in their blood, the organism was found in their livers, brains, ovaries and diaphragm muscles.

Toxoplasma organisms from the tissues of the hen were much more powerful than those from eggs. Tissue strains killed mice in five days, and egg strains did not kill mice even when allowed to gain strength.

Since chicken usually is adequately cooked, most of the disease-producing *Toxoplasma* probably are killed.

But raw eggs are another matter. The scientists, Drs. P. G. Pande, R. R. Shukla and P. C. Sekariah of the Indian Veterinary Research Institute at Mukteswar-Kumaon (U. P.), India, report in *Science*, 133:648, 1961, the probability that raw eggs are sources of human infection "needs urgent and immediate attention."

• Science News Letter, 79:168 March 18, 1961

SURGERY

Clogged Bile Duct Results in Gallstones

► WHEN THE BILE DUCT, connecting the gallbladder with the small intestine, becomes clogged for four to six months, gallstones result.

So conclude Drs. Albert Behrend and David J. Lieberman of the Albert Einstein Medical Center as a result of their experiments with dogs.

They reported that even a partial closing of the common bile duct, when left up to six months, resulted in stones. On examination, the gallbladder was distended and its wall thickened. Both gallbladder and bile duct contained thick muddy bile with small stones present, they told the American College of Surgeons meeting in Philadelphia.

They said the number and size of the stones formed was directly proportional to how much the bile duct was closed together and for how long. During the experiments the animals kept their normal weight and no evidence of jaundice appeared.

They said these studies suggest that narrowing or inflammation of part of the bile duct may be important in the formation of gallstones in man.

• Science News Letter, 79:168 March 18, 1961

THE FIELDS

MEDICINE

British Surgeon Calls Smoking Drug Addiction

► DOCTORS should help people overcome the tobacco habit, a British surgeon said, charging that smoking is a severe form of drug addiction and related to cancer of the lung.

Dr. Ronald W. Raven, Royal Marsden Hospital and Institute of Cancer Research, London, said in the British Medical Journal, March 4, 1961, that the serious rise in the occurrence of lung cancer in Great Britain and other countries "is a tremendous challenge to preventive medicine."

He said that although lung cancer is "now the greatest menace of all varieties of cancer and the harbinger of death to increasing thousands of people who will die in their prime," the solution of this problem is well known.

Dr. Raven said the extensive evidence "associating tobacco smoking and lung cancer is clear for all to study," and added that the effects of nicotine on the tissues in relation to cancer should be investigated.

The effects of nicotine on the unborn child should be studied, the surgeon said, "since nicotine can pass through the placental circulation." He raised the possibility of cellular changes in the fetus that may show effects in later life.

Apart from lung cancer, however, Dr. Raven said the lethal force of cancer has diminished and the outlook for men and women is better.

"A much greater international effort is required," he concluded, noting that more effective use should be made of present knowledge and that new ideas and clues are urgently required.

• Science News Letter, 79:169 March 18, 1961

PUBLIC SAFETY

Infant Gas Protectors Tested for Defense

► CHILDREN UP TO four years old may be protected with special equipment being tested by the U.S. Army Chemical Corps in anticipation of possible chemical and biological warfare.

With the support of the Office of Civil and Defense Mobilization, the Army Chemical Corps also is working on a new gas mask for protection of adults.

Col. George D. Rich, deputy assistant director of chemical, biological and radiological defense, OCDM, Battle Creek, Mich., said that 25,000 civilian masks would be distributed to state and local OCDM offices for demonstration by the end of 1961.

"The General Tire and Rubber Company is working with the Army Chemical Corps in testing the masks," Col. Rich said, "but eventually they will be made by

manufacturers for retail sale at \$2.50 each. It will be up to individuals to buy them for their own protection."

Col. Rich said the infant protectors are being tested at Dugway, Utah, by the Army Chemical Corps.

"The protectors are pup-tent-like devices," he explained, "with a strong aluminum frame along with a vinyl plastic covering. There are two large filter pads similar to civilian mask equipment."

Children will be provided with clear plastic windows to see out, and an apron-like flap can be rolled up for putting toys, milk bottles, etc., inside, Col. Rich said.

A larger filter system for shelters is ready for installation at one of the eight regional OCDM headquarters at Denton, Tex., where a shelter is to be built. This also is the product of Army Chemical Corps testing.

• Science News Letter, 79:169 March 18, 1961

TECHNOLOGY

Reference Point Chosen On Temperature Scale

► A NEW POINT on the centigrade temperature scale has been chosen as a standard reference for precise scientific measurements.

The National Bureau of Standards, Washington, D. C., said that the temperature value of 0.01 degree centigrade has replaced the freezing point, which was defined as 0.00 degree centigrade, as one of the fixed points on the scale. Although no temperature values on the scale were changed, more accurate temperature measurements will be obtained because of the new fixed point.

The new value, which is actually very near the freezing point, was chosen because it can be obtained more easily and accurately in the National Bureau of Standards laboratories.

Fixed points are the standard temperatures from which all temperature instruments are calibrated. They serve as an accurate base for all temperature relationships in the centigrade scale.

The fixed points are part of the "International Practical Temperature Scale of 1948" that is used as a standard in many countries.

• Science News Letter, 79:169 March 18, 1961

GENERAL SCIENCE

Grants for Advanced Science Writing Program

► COLUMBIA UNIVERSITY has received grants of \$100,000 each from the Alfred P. Sloan Foundation and the Rockefeller Foundation for an advanced science writing program.

The program, one of the first aimed at improving public information in science, is designed to give science writers an opportunity to broaden their scientific knowledge and to improve their interpretation techniques in new scientific developments.

The program was established three years ago by grants from the same foundations.

• Science News Letter, 79:169 March 18, 1961

NATURAL RESOURCES

Proper Management Of Water Urged

► PROPER MANAGEMENT of water resources will help stem the mushrooming need for more water throughout the world.

Wasteful squandering of man's water supply is evident throughout history, V. C. Williams, a consulting engineer, told the Society of Mining Engineers meeting in St. Louis. Converting sea water to fresh water will solve only part of the water problem.

Mr. Williams strongly urged industry to use water consumed for industrial purposes over and over again to sharply reduce industrial demand.

More than half the water in the United States is used for power and industrial purposes. To produce one ton of aluminum requires 350,000 gallons of water.

By recirculating water, a steel company in California reduced its water consumption from 65,000 gallons to 1,200 gallons per ton, Mr. Williams reported.

With the cost of natural fresh water increasing and converted salt water decreasing, the oceans should be considered in management plans, he said. Such factors as the natural fresh-water supply, power sources, and distance from ocean will determine a town or city's extent of salt water use.

The Society of Mining Engineers met as part of the annual meeting of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

• Science News Letter, 79:169 March 18, 1961

MEDICINE

Breast Cancer Victims Aided by Gland Removal

► IN CASES of inoperable cancer of the breast or recurrence of the cancer locally, removal of the pituitary or adrenal glands is of almost equal benefit.

An analysis of some 800 cases showed an average survival period of 20 months among patients who benefited from removal of the pituitary gland and an average of 22 months among those who benefited from removal of the adrenal glands.

An editorial in the Journal of the American Medical Association, 175:800, 1961, comments on the preliminary report of a joint committee of the American College of Physicians and the American College of Surgeons based on data pooled from 12 medical centers.

No other major form of human cancer "displays the vagaries, extremes and oddities of natural history encountered in cancer of the breast," the editorial states.

Results of the analysis indicate the two operations induce the same hormonal alterations that allow a regression of the disease in the responsive patient, the editorial concludes.

Removal of the two hormone-secreting glands is a part of hormonal treatment used in widespread breast cancer because of the influence of hormones on the breast.

• Science News Letter, 79:169 March 18, 1961

GENERAL SCIENCE

Making the Creative Scientist

Four major factors go into the making of a creative scientist: intelligence, motivation, training and hard work. The thrill of discovery is one of his rewards.

By **DR. GLENN T. SEABORG**
Chairman, U.S. Atomic Energy Commission

Address given at the awards banquet of the 20th Annual Science Talent Search in Washington, D. C., March 6.

► **IT IS AN HONOR** and an opportunity to be asked to speak at this twentieth Science Talent Search dinner. The honor is in being in such distinguished company—including the young and the not-so-young. The opportunity is that of congratulating these forty young men and women whom we honor here tonight on their achievements in science.

Our congratulations go also to the Westinghouse Educational Foundation, to SCIENCE SERVICE, and to the Science Clubs of America which for twenty years have made possible this exciting challenge to our high school students to explore the world of science and technology.

Twenty years is the span of time generally credited to the long sleep of the legendary Rip Van Winkle. When Rip came back to his village, the things that puzzled him most were the political and social changes. There had been a revolution. A new kind of money was being used. The townspeople talked about a Congress. There was a new nation in the world—the United States of America.

Important things also were happening in science at that time. A dozen elements,

including hydrogen and oxygen, were discovered. But it would have been ridiculous for the author, Washington Irving, to have Rip Van Winkle and the villagers talk about hydrogen and oxygen. There was little science in America then and even in the countries where these discoveries were made, there was no public interest in science.

Imagine how different it would be if we had a modern version of Rip Van Winkle. Suppose some person had cut himself off completely from our world twenty years ago and returned in time to look at the exhibits of these young people that we saw here over the weekend. He, like old Rip, would be bewildered. While there have been great political changes in the past two decades, a modern Rip Van Winkle doubtless would be puzzled most by the knowing talk of space vehicles, of nuclear power plants, of transistors and of the many uses of radioisotopes in our daily lives.

It is this explosive rate of scientific and technological advance and its importance to our society that sets the background for what I wish to discuss with you: "The creative scientist: his role and his training."

First, let us try to define a "creative scientist." He is a dedicated person of great natural intelligence who has been trained thoroughly and is hard at work on the frontiers of science. He is searching for

new facts or new and better explanations of the natural phenomena he sees around him.

He is doing important work—fundamental research. There may be no immediate practical use for his discoveries. When the big particle accelerator, the bevatron, was being planned at the Berkeley Laboratory that now bears his name, the late E. O. Lawrence was asked what he expected to get from this large atom smasher. His reply was, in effect: "If we knew that, there would be no need to build it."

Never Greater Need

Never was there a greater need for creative scientists and for fundamental research than now. Our energy resources must quadruple by the end of the 20th century. Nuclear power must be developed. The possibilities of solar power and the controlled release of energy in thermonuclear reactions must be explored vigorously. Great discoveries in geology, oceanography, metallurgy and in synthetic materials must be made if our wants are to be met in the face of diminishing supplies of rich pockets of raw materials. The grave problem of water use must be solved. New advances in public health, in the treatment of mental diseases, in care of the aged and in all branches of medicine are required.

For the rest of this century, the United States will be called upon to use extraordinary political and technical skill to aid the development of new and lagging countries toward economic and political stability and to guide the evolution of a stable inter-

Introducing Dr. Seaborg

► **THE LAST** two decades have been extraordinary times for many reasons, besides the rise of appreciation of science in war and peace and the discovery of young scientists like the winners of the Science Talent Search. The years since 1940 have been an era of elemental discovery such as never happened before and never will again. Tick off the new elements, transuranium elements found from 1940 onwards: Elements all heavier than uranium No. 92, 93 neptunium; 94 plutonium; 95 americium; 96 curium; 97 berkelium; 98 californium; 99 einsteinium; 100 fermium; 101 mendelevium; and 102 which is yet to be named. The great scientist who discovered or participated in the manufacture and discovery of the last nine of the most recent and heaviest chemical building blocks of the universe is our speaker tonight at the 20th Science Talent Search. He is Dr. Glenn T. Seaborg, Nobelist, who has just become chairman of the Atomic Energy Commission to which President Kennedy called him from the chancellorship of the University of California at Berkeley.



WINNERS—of Westinghouse scholarships are congratulated by Dr. Watson Davis, director of SCIENCE SERVICE, and Dr. Glenn T. Seaborg, chairman, U.S. Atomic Energy Commission. Left to right are: Edward Charles Jones, William Milton Adkins III, Dr. Davis, Daniel Ellis Kleinman, Dr. Seaborg, Joshua Wallman (top winner) and Harriet Jane Fell.

national order. No one can foretell exactly what form these developments will take. One thing is certain. There must be a continuing flow of new knowledge from the creative scientists for other scientists and engineers to convert to practical technology which will be increasingly important in the solution of national and international problems.

Four major factors go into the make-up of a creative scientist. They are: intelligence, motivation, training and a willingness to work hard.

Many great advances of science have been made by men of the highest intelligence. No man of meager intellect could have done what was done by Rutherford, Bohr, Einstein, Lawrence, and others of equal stature. This does not mean, however, that one has to be a genius. The great bulk of scientific discoveries were made by men of better-than-average intelligence but who were by no means in the genius category.

There is plenty of interesting and exciting work to be done by well-trained scientists who may not happen to be Enrico Fermi or John von Neumanns. In fact, much of the effectiveness of great men like them is due to the many lesser scientists who tried out their suggestions, investigated their findings or produced new data for them to consider.

Set a High Goal

To you young people here in this room and within the sound of my voice, I say: Set a high goal of achievement and be steadfast in your resolve to do everything possible to reach that goal. This leads us to motivation.

I believe every person has a deep psychological need to feel that what he is doing is of some importance, aside from the money he is paid for doing it. The scientist has the satisfaction of this need built into his life, and this gives zest and motivation to his efforts over an indefinite period of time.

Most scientists decided to embark on careers in science before they entered college. This was true in my own case. It was my teacher in chemistry and physics in the David Starr Jordan High School at Los Angeles, California, who generated the initial spark that propelled me into a scientific career. It is a tribute to the all too thin ranks of good secondary science teachers of today that the forty winners here tonight and the many who competed with them have shown an early interest in science.

The training of a creative scientist can be divided into two major steps: High school and undergraduate college study, and, from three to seven years of graduate and postgraduate work.

New science builds on the past. The scientist of today stands on the shoulders of those who went before him. Systematic and intensive research of the past few decades has produced an enormous accumulation of facts, hypotheses and theories that today crowd our libraries. The rate of accumulation increases yearly as new fields of inquiry are opened up.

The chief purpose of high school and

undergraduate science is to present the student, in a highly compressed form, the huge output of previous scientists. He should absorb the codified knowledge of science and acquire an understanding of the unifying principles and natural laws that form the basis of the codification. When the student gets his bachelor's degree, he should have accurate concepts of the general features of the sciences and be able to relate new information he will acquire in the future to what he has learned.

The task of the good teacher is to organize and present this vast accumulation concisely and effectively, making judicious selection from the mass of available material. The teaching must be flexible so that new advances, particularly when important discoveries are made, can be integrated with previous knowledge.

It is unfortunate that many of our high school science courses have not been brought up to date. Too often, when changes were made, it has been simply adding new material without relating it to the old. Part of the trouble stems from the poor salaries, inferior community status and misguided accreditation requirements that have made a career in high school teaching unattractive to qualified professional scientists.

Improvement is under way. There is renewed interest of universities, professional societies, industry, private foundations and government agencies—including the one it is now my privilege to head, the Atomic Energy Commission—in the plight of the high schools.

This interest has taken the form of summer institutes for retraining of teachers, writing projects to revise course outlines and textbooks, special programs and courses on television, new films, and publication of a wealth of material in paperback form.

New programs supported by the National Science Foundation, such as the Physical Sciences Study Committee for Physics, bid fair to revolutionize secondary science teaching. Similar groups are at work in the fields of chemistry, mathematics and biology—all on a cooperative basis with university scientists, school administrators and high school teachers participating.

I urge every school board, every school administration and every interested citizen to get acquainted with these new programs and consider how their school system might benefit from them.

In general, the undergraduate colleges face the same problems which are compounded by the enormous increase in the number of students that looms ahead in next decade.

A word about the colleges: March and April are months of anxiety for thousands of high school seniors all over the country. They have taken the various tests, filed their applications and now wait to hear if they will be accepted by the college of their choice.

You will be well advised to choose the best college within your scholastic and economic ability to attend. It is not necessary to go to a large university with a famous staff to get good undergraduate training in

(Continued on p. 172)

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3-18-61

The Creative Scientist

(Continued from page 171)

science. Many of the smaller high-quality liberal arts colleges have made impressive records in preparing those majoring in science for entry into the graduate schools.

The second major step in the making of a creative scientist is his training in methods of carrying on scientific investigation. There are exceptions but generally we must rely on the discipline of our graduate schools to convert the trained intelligence of the undergraduate to the creative intelligence of the research scientist.

The doctor's degree is the symbol of the successful completion of this conversion. In basic science—and to an increasing extent in all science and engineering—the Ph.D. or Sc.D. degree is the rule rather than the exception for positions of mature responsibility.

In the graduate school, the student is put in a laboratory under the supervision of a master scientist. The candidate for the Ph.D. must do a piece of original scientific investigation on a problem that may be quite difficult and of considerable importance in his field.

This is where he learns experimental techniques; how to set up a meaningful experiment; how to extract correct answers from the data he collects; the importance of letting an unexpected result lead to new conclusions or to new experiments.

Graduate research is a rigorous, demanding experience that makes an enormous change in the scientific effectiveness of the doctoral candidate. At many institutions, the research interests of the teaching scientist are very advanced and are likely to be in a frontier area far beyond the material currently appearing in undergraduate textbooks.

The professor also is stimulated greatly

by the student. The latter comes to the problem with a different educational background and is eager to work hard to find out what the experiments will reveal. This fresh outlook usually makes valuable contributions to the research being pursued.

We can be proud of the graduate schools of our great universities. They meet the qualifications of excellence. They train virtually all of our great creative scientists. They tackle the big problems, especially in fundamental research. The fact that more than forty living Americans hold the Nobel Prize in chemistry, physics or medicine attests the productive work of our graduate schools of science.

The serious problem is that these fine schools are small in size and in number. It is urgent that they be strengthened, that their number be increased, that the educational and research processes be better integrated, and that ways be found to extend the creative stimulation of graduate education into more of the laboratories in which fundamental research is done. This problem was the subject of a special report to the White House made by a Panel of the President's Science Advisory Committee. I had the honor of serving as chairman of that Panel.

This brings me to my last point—work, plain old-fashioned hard work. This matter of hard work runs counter to the modern trend toward shorter work weeks and more leisure time. I recognize the importance of these developments in society generally but I cannot feel that the 35-hour week has much relevance for a creative scientist.

The greater effort expected of the scientist seldom is extracted against his will. Most scientists are able to get the kind of jobs that allow them to do work they genuinely love. They do not work simply because it is necessary to work to live. The intellectual satisfactions, the thrill of discovery, the sense of worthwhile effort are rich rewards and strong stimuli to sustained effort.

Scientists as a group definitely are not clock-watchers. The large majority of my personal acquaintances work in laboratories where the doors are never locked and where lights frequently burn late into the night.

I hope this outline of what is required to become a creative scientist will not discourage any who may hear or read what is

said here. If I may judge from my experience in talking with young people, many of you lack self-confidence and are somewhat hesitant about visualizing yourself as potentially an important scientist. Others wonder how they will finance their years of study. To this group I would say three things:

First—One does not have to make a final decision in high school or even in the first two years of college. By the time you are a college junior, you can make a choice with a clearer knowledge of your interests, ambitions and abilities.

Second—If you set your course in one of the sciences, the number of scholarships for undergraduate work is increasing and there are several ways to meet the cost of the years of graduate study. Many fellowships are available. Teaching and research appointments are fairly common. Often a graduate student can meet most, if not all, of his expenses through some combination of these.

Third—If you decide that your talents will be used best in a non-scientific field, I assure you that the effort you have put in science subjects will not be wasted. Science plays such an important role in our lives that the work of nearly every professional person is carried on better when he has some fundamental understanding of the nature of science.

Science Changes the World

In the world of today, people in all walks of life and all occupations—even the housewife and mother—see their daily tasks undergo continual change because of the rapid advance of science and technology. To be an effective breadwinner and citizen of today and tomorrow, it is necessary to extend your understanding of science.

You may now ask: If one has the qualifications you have outlined and does the things you say are necessary, will he be a great scientist? There is no scientific answer to that question. It is hard to put a finger on what is the key to success. In science, as in other professions, the human factor is important.

One cannot explain why one scientist wins high recognition and another of equal promise does not. But one can say that, whatever may be the degree of achievement, the satisfactions of a career in science are deep and lasting.

We live in an age in which, for better or worse, the influence of science is revolutionary. It is part of our culture, shaping every aspect of our lives and our institutions.

We can no more ignore it than the men of the Middle Ages could ignore the feudal system. Properly nurtured and manned with adequate numbers of trained people, science can provide marvelous tools for the solution of many of the grave problems of our physical and social world.

The mishandling or ignoring of science can lead us to disastrous consequences. I take great hope and comfort in the fact that enterprises such as this science talent search augur well for the future use of science in the United States.

• Science News Letter, 79:170 March 18, 1961

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Books of the Week

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

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ABOUT THE BIGGEST SALMON—Will Hayes—*Melmont Pubs.*, 31 p., illus. by Henry Luhrs, \$2.50. For young readers.

ANIMAL TREASURE—Ivan T. Sanderson—*Viking*, 330 p., illus. by author, paper, \$1.45. Reprint of naturalist's observations in the virgin forests of West Africa.

ARISTOTLE'S PHYSICS—Transl. by Richard Hope—*Univ. of Neb. Press*, 241 p., \$6. New translation presents Aristotle's ideas as we would express them, while analytical index of technical terms enables reader to determine Greek or Latin terms paraphrased.

BINOCULARS & SCOPES: How to Choose, Use & Photograph Through Them—Robert J. and Elsa Reichert—*Chilton Co.*, 128 p., photographs, \$2.95; paper, \$1.95. Describes a technique useful in the study of wildlife.

CHEMISTRY: A First Course in Modern Chemistry—Alfred B. Garrett, John S. Richardson and Arthur S. Kiefer—*Ginn*, 726 p., illus., \$5.60. Correction: This is a high school textbook, not introductory college, as listed in SNL, Feb. 11, 1961, p. 92.

CHILD DEVELOPMENT AND CHILD PSYCHIATRY: In Tribute to Dr. Arnold Gesell in his Eightieth Year—Charles Shagag and Benjamin Pasamanick, Eds.—*Psychiatric Res. Reports, Am. Psychiatric Assn.*, No. 13, 225 p., illus., paper, \$2. Research conference papers and discussions by foremost American investigators in child development.

COLLEGE CHEMISTRY: A Systematic Approach—Harry H. Sisler, Calvin A. Vanderwerf and Arthur W. Davidson—*Macmillan*, 2nd ed., 709 p., illus., \$7.50.

CONGRESS VERSUS THE SUPREME COURT, 1957-1960—C. Herman Pritchett—*Univ. of Minn. Press*, 168 p., \$3.75. Review and analysis of various cases before the Supreme Court, such as in the passport and the loyalty-security issues.

CURRENT PROBLEMS IN ANIMAL BEHAVIOUR—W. H. Thorpe and O. L. Zangwill, Eds.—*Cambridge Univ. Press*, 424 p., \$8.50. Essays on neural mechanisms and behavior, studies of problems common to the psychology of animals and man, and theoretical approaches to behavior.

DENTAL HYPNOSIS HANDBOOK—Jacob Stolzenberg, D.D.S., foreword by William S. Kroger, M.D.—*Wilshire Bk. Co.*, 152 p., paper, \$2. Reprint of 1950 edition.

DELINQUENCY AND OPPORTUNITY: A Theory of Delinquent Gangs—Richard A. Cloward and Lloyd E. Ohlin—*Free Press*, 220 p., \$4. Sociological analysis of why delinquent rules of conduct develop and of the conditions which account for delinquent "subcultures."

ELECTRODYNAMICS OF CONTINUOUS MEDIA—L. D. Landau and E. M. Lifschitz, transl. from Russian by J. B. Sykes and J. S. Bell—*Addison-Wesley*, 417 p., \$12.50. Deals with the theory of electromagnetic fields in matter and with the theory of macroscopic electric and magnetic properties of matter.

ELEMENTS OF STATISTICAL INFERENCE—Robert M. Kozelka—*Addison-Wesley*, 150 p., \$5. Designed as one-semester course following an introductory course in calculus.

ENZYMOLGY IN THE USSR: A Review of the Literature—Chester W. De Long—*Public Health Service (GPO)*, 189 p., paper, 65¢. Provides

review and short summaries of Soviet research on human and animal enzymes, microbial enzymes, and plant enzymes.

THE EVOLUTION OF PHYSICS: The Growth of Ideas from Early Concepts to Relativity and Quanta—Albert Einstein and Leopold Infeld—*Simon & Schuster*, 302 p., illus., paper, \$1.45. Reprint of 1938 edition, written for the intelligent layman.

GALAPAGOS: The Noah's Ark of the Pacific—Ireus Eibl-Eibesfeldt, transl. from German by Alan Houghton Brodrick—*Doubleday*, 192 p., 32 photographs, \$3.95. Skin-diving zoologist's observations of animal life on the islands Darwin called "living laboratory of evolution."

GENETICS IS EASY: A Handbook of Information—Philip Goldstein—*Viking*, 2nd ed., 238 p., illus. by author, paper, \$1.45. Explains basic principles of heredity for the general reader.

THE GLYCOSIS AND RESPIRATION OF TUMORS—Alan C. Aisenberg—*Academic*, 224 p., \$8. Reports on important research in the field of energy metabolism of tumors.

GUIDE TO MARINE FISHES—Alfred Perlmutter—*N. Y. Univ. Press*, 431 p., illus., \$6.50. For rapid identification by way of external characteristics, illustrated by silhouettes, includes fishes and fish-like vertebrates found from Cape Cod to Cape Hatteras.

HUMAN FACTORS IN JET AND SPACE TRAVEL: A Medical-Psychological Analysis—S. B. Sells and Charles A. Berry, Eds., foreword by Oliver K. Niess—*Ronald*, 386 p., illus., \$12. Comprehensive sourcebook on human-factor aspects of high-speed and high-altitude travel.

HUMAN GROWTH, Vol. III—J. M. Tanner, Ed.—*Pergamon*, 120 p., illus., \$5. Among others contains papers on age changes in primates and their modification, genetics of human growth, and influences affecting prenatal growth in man.

THE IMPACT OF ATOMIC ENERGY: A History of Governments, Scientists and Religious Groups—Erwin N. Hiebert—*Faith & Life Press*, 302 p., \$4. Documents the reactions of scientists, the political community, nations and the church to the development of nuclear weapons, from a moral viewpoint.

INTERNATIONAL REVIEW OF TROPICAL MEDICINE, Vol. I—David Richard Lincicome—*Academic*, 300 p., illus., \$10. Critical reviews of the state of medical practice and science in the tropics.

INTRODUCTION TO ATOMIC AND NUCLEAR PHYSICS—Otto Oldenberg—*McGraw*, 3rd ed., 380 p., illus., \$7.95. One-term intermediate course, attempts to train student to understand and judge atomic theory rather than to accept it on authority.

INTRODUCTION TO FOURIER ANALYSIS AND GENERALISED FUNCTIONS—M. J. Lighthill—*Cambridge Univ. Press*, 79 p., paper, \$1.95. First printed 1958.

INTRODUCTION TO THE THEORY OF LINEAR DIFFERENTIAL EQUATIONS—E. G. C. Poole—*Dover*, 202 p., paper, \$1.65. Reprint of 1936 edition.



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THE MATHEMATICAL THEORY OF RELATIVITY—A. S. Eddington—*Cambridge Univ. Press*, 270 p., paper, \$2.95. First published in 1923.

MENTAL HEALTH OR MENTAL ILLNESS? Psychiatry for Practical Action—William Glasser, foreword by Morris Herman—*Harper*, 208 p., \$3.75. Presents basic concepts of normal and abnormal human functioning, psychiatric treatment and mental hygiene for those who work with delinquent adolescents.

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THE MOON: Our Nearest Celestial Neighbour—Zdenek Kopal—*Academic*, 131 p., illus., \$4.50. Describes in non-technical language what we know about the physical properties and the surface of the moon, explaining experimental methods and reasoning behind interpretations.

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• Science News Letter, 79:173 March 18, 1961

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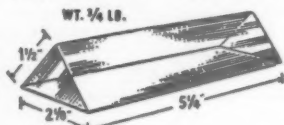
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PSYCHIATRY

Warning Against Quick Hypnosis Courses

➤ PSYCHIATRISTS are worried about use of hypnosis by medically untrained individuals to treat patients with mental illness. They oppose "quickie" courses by persons with no medical training who teach only how to put a person into a trance.

To the public and to the 12,000 members of the American Psychiatric Association, a committee of the APA has sent a warning against these dangers.

Whoever makes use of hypnosis, they warn, should know enough about psychiatry to know when hypnosis would be actually dangerous to the patient. Although every physician faces certain dangers if he uses any kind of treatment improperly, the nature of hypnosis makes the improper use of this technique particularly hazardous.

The psychiatrists are not opposed to use of hypnosis under proper circumstances and do not frown on the study of hypnosis by physicians and dentists. Such training should be given in medical schools, however. The course should be long enough and broad enough so that the students can learn something about patients—when hypnosis might be expected to help them and when it might be a great danger to them.

"Physicians practicing hypnosis," the psychiatrists stress, "should do so only in their particular field of medical competence."

They emphasize the need for continued research on hypnosis and its place in treatment.

• Science News Letter, 79:174 March 18, 1961

Do You Know

More *meteorites* fall in June than in any other month.

More than 150,000,000 Asians profess the Buddhist *faith*.

The Cromwell Current, a shallow "oceanic subway" in the Pacific Ocean, probably transports fish from the East Indies to the South American west coast.

• Science News Letter, 79:174 March 18, 1961

Questions

MEDICINE—What is the absolute five-year survival rate for breast cancer for a 30-year period? p. 164.

METEOROLOGY—How many persons were injured when a tornado hit Chicago recently? p. 162.

Photographs: Cover and p. 163, Westinghouse-United Press News Photo; p. 162, University of California; p. 163, National Museum of Canada; pp. 167 and 170, Fremont Davis; p. 167, center left, Westinghouse.

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• Science News Letter, 79:176 March 18, 1961

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• Science News Letter, 79:176 March 18, 1961

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• Science News Letter, 79:176 March 18, 1961

• **TOY ROBOT**, shown in the photograph, comes completely assembled but young engineers and tinkers can take it apart and put it together again from accompanying instructions. The robot can be wound up to walk, squawk, swing its



arms, ring a bell and move its jaws. Transparent wheels and plastic body reveal colored gears in action.

• Science News Letter, 79:176 March 18, 1961

• **SOLDER PEN** has handle that can be removed and screwed on to cover tip and barrel, permitting soldering iron to be carried around safely in shirt pocket even when hot. The handle of the 30-watt

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• Science News Letter, 79:176 March 18, 1961

• **ALUMINUM FOIL PANS** now come in new shapes, colors and with special functional coatings. These include a rigid foil jacket for gourmet preparation of mashed potatoes, individual casseroles or desserts, red sweetheart cake pans, a 12-inch black bottomed pizza pan, and copper colored party cups and cake pans, suitable for baking and serving.

• Science News Letter, 79:176 March 18, 1961

• **SWIVEL-HEAD DRY MOP** attracts and pulls dust out of corners because its wool fiber head builds up harmless electrostatic charge that helps to attract dust to it. The 54-inch maple handle has swivel feature that eliminates stooping to reach dust under beds and furniture.

• Science News Letter, 79:176 March 18, 1961

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• Science News Letter, 79:176 March 18, 1961



Nature Ramblings



► **WHEN ST. PATRICK** landed in Ireland in the year 432 and began to preach, the High-king Loigaire asked, so the story goes, to be told what is the Holy Trinity?

Patrick picked a shamrock from the ground and explained that, like the leaves of this little plant, the Holy Trinity was three in one, yet one in three. Thus the shamrock saved the day, and the king allowed Patrick to continue with his work. Today statues of Patrick show him holding the shamrock in his right hand, and millions of people display and wear the shamrock on St. Patrick's Day.

Just what plant Patrick stooped down to pluck cannot be stated with certainty. One of the hop clovers, *Trifolium dubium*, is now regarded by many as the true shamrock, but the common white clover long has been a favorite and is still a leading contender.

If the white clover is the true shamrock, it is not found uniquely in Ireland, as some

Shamrock



Irishmen would have us believe. It grows wherever a chalk or limestone soil gives it favorable rootage. Its special luxuriance in Ireland is due simply to the combination there of ideal soil conditions and the peculiar Irish climate, with its mild winters and long, cool, moist summers.

One other plant contests with the clovers for the honor of being the original sham-

rock. This is one of the species of the oxalis, variously known as sheep sorrel or wood sorrel, well known in this country, especially to children who like to nibble its sour leaves. Old Irish herbals give this plant the name of "seamrog" and ascribe to it medicinal virtues almost miraculous.

The oxalis may have come into the shamrock competition because the Irish have sent this plant to England for festive occasions, while the white clover stayed at home for Irish celebrations.

It will never be possible to determine the matter accurately; and indeed to the botanists of that early date there was little difference.

Before the seventeenth century or thereabouts, plants were classified by their leaves rather than by their flowers.

The three-leaved clover and the three-leaved oxalis were both "shamrocks" to the early Irish.

• Science News Letter, 79:176 March 18, 1961

